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RESEARCH COORDINATING UNIT FOR VOCATIONAL EDUCATION IN WASHINGTON STATE DEPARTMENT OF PUBLIC INSTRUCTION. FINAL REPORT.

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DESCRIPTORS- *RESEARCH COORDINATING UNITS, *EDUCATIONAL RESEARCH, *VOCATIONAL EDUCATION, *STATE PROGRAMS, *PROGRAM DESCRIPTIONS, RESEARCH PROJECTS, WASHINGTON,

THE WASHINGTON RESEARCH COORDINATING UNIT (RCU), ORGANIZED IN THE WASHINGTON STATE DEPARTMENT OF PUBLIC INSTRUCTION ON JUNE 1, 1965, AIMED TO INITIATE, COORDINATE, AND RELATE VOCATIONAL EDUCATION RESEARCH, ACTIVITIES, AND INFORMATION TO MEET THE VOCATIONAL NEEDS OF THE STATE'S YOUTH. MAJOR PROJECTS CARRIED OUT UNDER CONTRACT BETWEEN THE RCU AND OTHER AGENCIES AND INDIVIDUALS WERE--(1) THE DEVELOPMENT OF A GRADUATE FOLLOWUP SYSTEM USING DATA PROCESSING TECHNIQUES, (2) A NEEDS SURVEY FOR OCEANOGRAPHY TECHNICIANS, (3) THE DEVELOPMENT OF AN INTRODUCTORY PROGRAM FOR DISTRIBUTIVE EDUCATION, (4) AN AGRI-DISTRIBUTION EDUCATION FEASIBILITY STUDY, (5) THE OPERATION OF AN INDUSTRIAL COOPERATIVE TRAINING PROGRAM FOR AIRCRAFT ASSEMBLERS, AND (6) THE DEVELOPMENT OF PROGRAMED INSTRUCTIONAL MATERIALS FOR AGRICULTURAL EDUCATION. THE UNIT STAFF CONDUCTED AN OVERALL COST STUDY OF VOCATIONAL EDUCATION IN THE STATE AND IN-DEPTH ANALYSES OF THE SPECIFIC PROGRAMS FOR ENGINEERING AIDES, OFFICE OCCUPATIONS, ELECTRONIC TECHNICIANS, WELDING, MID-MANAGEMENT PERSONNEL, LICENSED PRACTICAL NURSES, KEY PUNCH OPERATORS, AUTO MECHANICS, AND DATA PROCESSING TECHNICIANS. THE UNIT OFFERED CONSULTANT SERVICES FOR A STUDY OF MANPOWER NEEDS IN HEALTH OCCUPATIONS, FORMATION OF THE RESEARCH AND DEVELOPMENT CENTER AT WASHINGTON STATE UNIVERSITY, A VOCATIONAL EDUCATION PROJECT IN THE SEATTLE SECONDARY SCHOOLS, AND A SCHOOL OF BUSINESS. RCU PERSONNEL ATTENDED STATE AND NATIONAL CONFERENCES AND DISSEMINATED INFORMATION ABOUT COMPLETED PROJECTS. HOWEVER, DISSEMINATION IS AN AREA THAT NEEDS TO BE EXPANDED. (EM)

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FINAL REPORT

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RESEARCH COORDINATING UNIT FOR VOCATIONAL EDUCATION IN
WASHINGTON STATE DEPARTMENT OF PUBLIC INSTRUCTION

June 27, 1967

U. S. DEPARTMENT OF
HEALTH, EDUCATION AND WELFARE

Office of Education
Bureau of Research

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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RESEARCH COORDINATING UNIT FOR VOCATIONAL EDUCATION IN WASHINGTON STATE DEPARTMENT OF PUBLIC INSTRUCTION

Project No. 5-0108
Contract No. OE-5-85-124

George P. Pilant
Coordinator

June 27, 1967

The research reported herein was performed pursuant to a contract with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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98501

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INTRODUCTION

The Research Coordinating Unit for Vocational Education in the Washington State Department of Public Instruction came into being through provisions of Public Law 88-210 and subsequent legislation. A proposal was submitted to the Director of the Occupational Research and Planning Program, United States Office of Education, May 10, 1965, for the establishment of such a unit.

The Research Coordinating Unit began officially June 1, 1965, with authorization for the expenditures of $96,554 in Federal funds, supplemented by $5,100 in local funds. The termination date of the contract was November 30, 1966, subsequently extended to February 28, 1967. Prior to the expiration of the original contract, a new proposal was submitted. Approval has assured continuance of the Unit's activities to June 30, 1968.

The objectives of the Research Coordinating Unit were: to initiate, coordinate and relate vocational research projects, activities and information already existing, and which might be planned, to meet the special vocational needs of youth in the State of Washington.

METHOD

In order to fulfill the stated objectives the Unit became engaged in four basic activities in which it:

1. Coordinated local, state federal and private vocational research activities;

2. Designed state research projects and activities that attempted to assist schools in the improvement of vocational educational programs;

3. Served as a statewide clearinghouse of vocational research information for state staff and local district vocational educators; and

4. Provided skilled research consultant service to vocational educators throughout the State.

Physically the Research Coordinating Unit was housed in the offices of the Superintendent of Public Instruction, Olympia, Washington. It became a part of the Research Office, whose director was also the Research Coordinating Unit director, one-fourth time. The Research Office attempted a new definition of research for a state agency, namely, having as its prime and only goal the improvement of instruction in the classrooms of the State of Washington. The usual role of data bank or statistics unit was carefully avoided in order to maintain a unique curriculum and instruction emphasis.

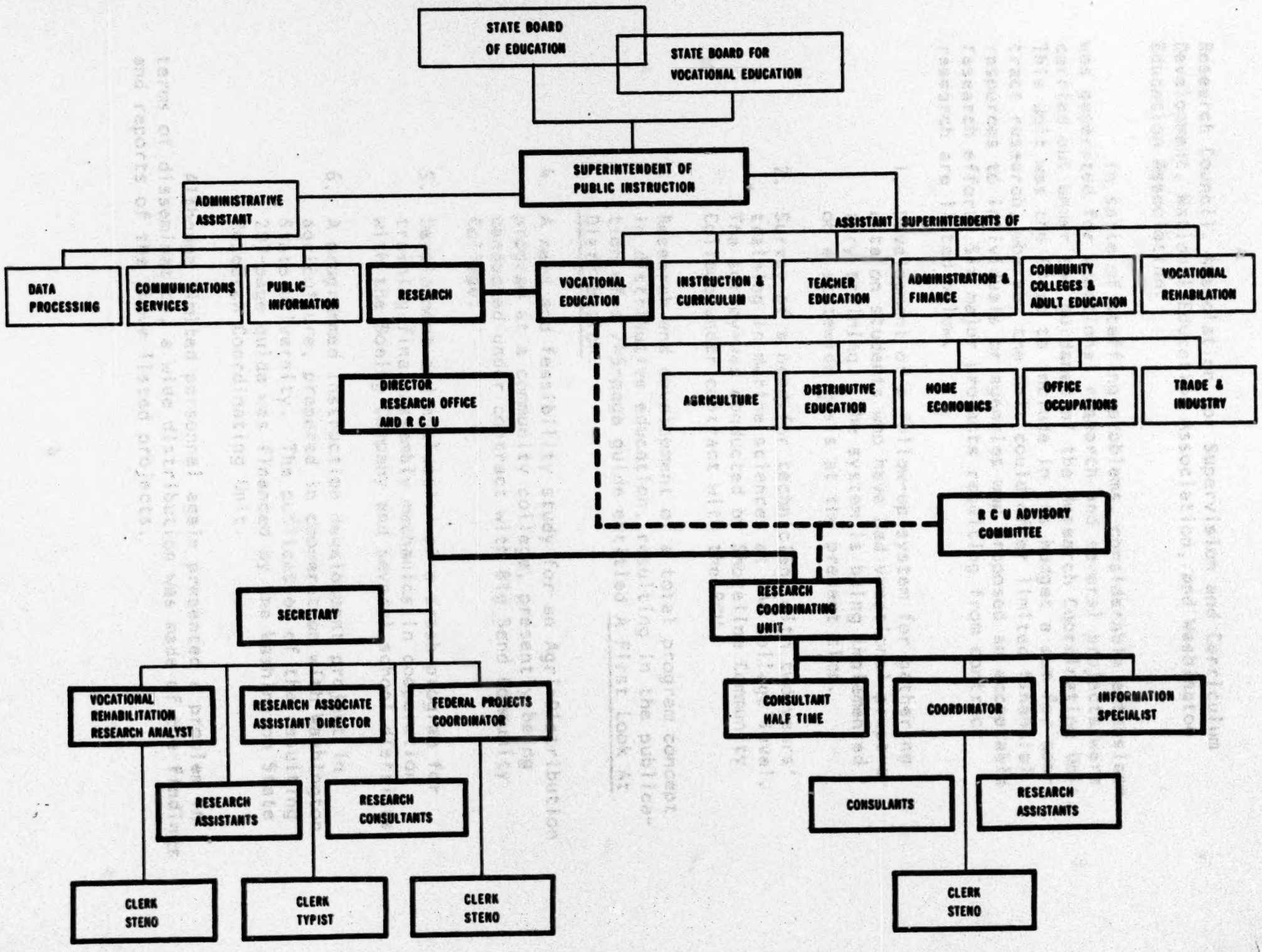
The Vocational Education Division, prior to the advent of the Research Coordinating Unit, had received only token attention from the Research Office because of a small budget, which limited the number of personnel employed and scope of services offered. With the addition of the RCU, vocational research achieved a better balance of attention.

The greatest stumbling block to full realization of the potential of the RCU was the inability to hire staff. The director, at one-fourth time, and an information specialist at one-half time, were the only assigned personnel from June 1, 1965, until January 1, 1966. On that date a half-time consultant was hired, who brought with him a wealth of experience in vocational education. He came to the Research Coordinating Unit on released time from his regular post as director of a local vocational-technical school. Not until September, 1966 was a full-time coordinator hired. For two-thirds of the twenty-one months the RCU existed, it was not possible to staff the Unit adequately. Trained personnel could not be found.

Several agencies were contacted and lines of communication established to carry out the responsibilities of the Research Coordinating Unit. Included were agencies at all levels of public education, the Bureau of Economic Development, the Employment Security Office, Research Coordinating Units in other states, the Northwest Regional Educational Research Laboratory, the Research and Development Unit at Washington State University, ERIC at Ohio State University, The Center for Vocational and Technical Education at Ohio State University and others. Businesses, notably the Boeing Company, had a working relationship with the Unit.

Staff personnel were members of, and participated in the activities of related organizations such as the American Educational Research Association, American Vocational Association, Washington Vocational Association, Puget Sound Educational

ORGANIZATION - RESEARCH COORDINATING UNIT



Research Council, Association for Supervision and Curriculum Development, National Education Association, and Washington Education Association.

In spite of staffing problems, considerable enthusiasm was generated for vocational research and several projects were carried out under the guidance of the Research Coordinating Unit. This Unit was the first to include in its budget a sum for contract research, whereby the Unit could offer limited financial resources to individuals or agencies who proposed an acceptable research effort. Six major projects resulting from contract research are listed below.

1. Development of a follow-up system for gathering data on students who have had vocational preparatory training. The system is being implemented on a statewide basis at the present time.

2. Survey of a need for technicians with two years' training in marine sciences at the college level. The survey was conducted by Shoreline Community College under contract with the RCU.

3. Research and development of a total program concept in distributive education, resulting in the publication of a 245-page guide entitled A First Look At Distribution.

4. A need and feasibility study for an Agri-Distribution program at a community college, presently being conducted under contract with Big Bend Community College.

5. Development and evaluation of a crash program for training final assembly mechanics in cooperation with the Boeing Company and several school districts.

6. A programmed instruction development project in agriculture, prepared in cooperation with Washington State University. The publication of the resulting 207-page quide was financed by the Washington State Research Coordinating Unit.

Although limited personnel again presented a problem in terms of dissemination, a wide distribution was made of the findings and reports of the above listed projects.

One major research project was undertaken by the RCU staff itself, namely, a cost analysis of vocational education in Washington State. This was timely in that the State Legislature was in the process of separating Community Colleges and the Vocational Education Division from the Office of the Superintendent of Public Instruction. Data gathered in conducting this project were used both by school people and legislators.

Research Coordinating Unit personnel participated in local, state and national conferences and meetings that would assist in accomplishing the aims of the organization. One or more staff members were in attendance at each of the following:

Western States Regional Conference of RCU Personnel, Flagstaff, Arizona, November 18 & 19, 1965.

Seminar on Development and Coordination of Research, Columbus, Ohio, January 31, - February 4, 1966.

Vocational Education Seminar, Athens, Georgia, February 6 - 11, 1966.

Regional Conference on Vocational and Technical Education, Denver, Colorado, April 18 - 22, 1966.

National Conference on Role of the State Educational Agency in Teacher Education, Seattle, Washington, April 27 - 29, 1966.

Conference on Educational Research at the Local Level, Bellingham, Washington, August 1 - 5, 1966.

Washington Vocational Association Annual Conference, Spokane, Washington, August 21 - 26, 1966.

National RCU Conference, Washington, D. C., September 20 - 22, 1966.

AVA Convention and Research Training Institute, Denver, Colorado, December 4 - 9, 1966.

Western Regional RCU Conference, Phoenix, Arizona, December 15 & 16, 1966.

PERT Conference, Columbus, Ohio, January 17 - 19, 1967.

AERA 1967 Annual Meeting, New York, New York, February 16 - 18, 1967.

Emerging Role of the State Education Department, Columbus, Ohio, February 27, - March 2, 1967.

The Coordinator regularly participated in meetings of the Puget Sound Educational Research Council; an organization made up of local school district and college personnel interested in educational research. Frequent attendance at state and local meetings of vocational educators was necessary in order to coordinate research activities and be made aware of developments in vocational education generally.

RESULTS

The major contribution of the Research Coordinating Unit, other than the results obtained from contract research, was to make the Research Office and the entire spectrum of state education administration more conscious of, and concerned with the problems of vocational education. Persons who might otherwise have had little occasion to think about vocational education became involved in research in that area. Hopefully, this concern will be reflected in better vocational education programs offered to the youth of the State of Washington.

Follow-Up System Development

Probably the most widely known of the Research Coordinating Unit's activities was the development of a system for the follow-up of vocational-technical school students, using electronic data processing techniques. The purpose of the project was to develop a system which would efficiently follow students who have had vocational preparatory training. It would provide factual information in terms of the number of students employed in the occupation for which they were trained. Data would be available to evaluate the job being done in vocational education programs. The system was designed to use practical methods to encourage a high percentage of voluntary response.

The follow-up will be initiated on a statewide basis beginning September, 1967, and will be used on a pilot basis to evaluate the effectiveness of an earlier crash program for training mechanics in the airplane industry, in April, May and June, 1967. The implementation of the follow-up will be undertaken by the Vocational Education Department, with the RCU in a consultant capacity.

Under the guidance of the New Mexico Research Coordinating Unit, that state will also initiate this system. Arizona plans to incorporate several features of the Washington plan into their own, and other states have expressed interest.

Marine Sciences Technology Study

Recent advances in industrial, institutional and governmental areas have made it increasingly evident that there is a need for personnel with specialized training in marine science technology. The Research Coordinating Unit staff, personnel from the Vocational Education Department and Shoreline Community College faculty members discussed this subject at some length during the spring of 1966. As a result of these discussions, the college conducted a survey during that summer to determine the feasibility of establishing a Marine Science Technology curriculum at a two-year post high school institution. The project was funded by the RCU, and RCU personnel functioned as consultants during the course of the investigation.

The following were determined to be the objectives of the study:

a survey of industries, institutions and governmental agencies concerned with the fields of Oceanography and Marine Biology;

a tabulation of the jobs performed by technicians in these fields;

an assessment of those facilities which are already established to train these technicians; and

the feasibility of setting up a Marine Technician training program at the community college level.

On this basis data were gathered in these classifications:

Marine Biology Technicians;
Physical Oceanographic Technicians; and
General Biology Technicians.

Results of the study indicated a need for more than one thousand technicians in the Seattle metropolitan area in the next three years. The data showed that there was not only a need for these technicians, but for diesel engineers, refrigeration mechanics, cooks, stewards, yeomen, commercial fishermen, net makers and

licensed merchant marine officers, as well. Reasons for the phenomenal demand for technicians seemed to be:

improved environmental prediction and modification;

pressure for development of new sources of raw materials;

interest in more exploitation of biological resources in the sea, ranging from fish yields to biomedical applications;

concern with pollution of beaches, estuaries, and other waters;

improvement in ocean navigation, ship design and ports;

national defense;

awareness of the lag in ocean exploitation by the United States compared to other countries of the Pacific Rim; and

replacement of engineers and scientists by technicians, where routine data taking is done, freeing the high salaried professional scientist or engineer to do work for which he alone is qualified.

The data gathered in the project indicated that there is a need for the establishment of at least one Marine Biology laboratory technician training program and, in conjunction with this, because they are so closely related, the establishment of a training program for Physical Oceanographic technicians.

The data indicated that there is a great need for General Biology Technician training programs in the Puget Sound area.

Community colleges and vocational schools should be aware of the need for the other types of training listed above. The existing programs and resources are not sufficient to train the technicians needed by industry and research today.

Curricula should be developed at the community college level to train students to do these jobs. Because of location, enthusiastic interest by the present faculty, (eight of whom have been employed in these areas recently) and community and school board support and approval, Shoreline Community College is an ideal choice to proceed with the task of training marine related technicians. Already large numbers of students, sufficient to begin

a pilot program, have indicated interest in enrolling in these programs as they develop.

A laboratory facility to train personnel in Marine Science technologies should be planned and developed around the curricula for these programs. A main feature of this laboratory facility should be the inclusion of an instrumentation section to be used in the training of technicians. The latest instruments used in the marine sciences should be available to teach their operation and maintenance to prospective technicians. The other unique feature of the facility should be flowing salt water to provide living specimens and actual operation of instruments under the fresh and salt water conditions students will meet on the job.

Included in the survey were twenty-eight of the major marine science laboratories on the Pacific Coast. The operation of each laboratory was observed. Although they were sea water laboratories, none provided the type of training envisioned in this study. The good points, as well as problem areas, were noted. It is hoped that with this information at hand, the design and operation of the laboratory facility at Shoreline Community College will be optimal.

Facilities such as those described above would attract trainees who would take part in a program providing:

courses for adult education in the fields of natural history and conservation of marine resources. Courses would also be offered to local fishermen to update their knowledge of the latest electronic gear available;

Teacher In-Service courses. These courses would be aimed primarily toward elementary, high school teachers and counselors, so they may teach the importance of the Marine Sciences to the students, and acquaint them with career opportunities;

a Marine Science field trip center for elementary, junior high and senior high schools to introduce students to the Marine Sciences. This facility could also be used during the summer for interested students to participate in Marine Science Institutes;

a study facility for those portions of other programs such as: Biology, Botany, Chemistry, Electronics, Engineering, Geography, Geology, and Physics, which pertain to the Marine Sciences; and

a small, local aquarium and museum for the Marine Sciences and industries.

As a result of this project, a pilot program in Marine Technology has been established and is in operation at Shoreline Community College.

Distributive Education Teachers' Guide

The Vocational Act of 1963 made possible new approaches to vocational education. Legal provisions before 1963, for instance, made it mandatory that distributive education occupational and classroom training be conducted concurrently. Investigation showed that most DE coordinators have firm convictions that pretraining should be given before a student enters a cooperative training program. In the summer of 1966, the Research Coordinating Unit hired a consultant to incorporate both basic and applied learning into a new, total program concept of distributive education.

The results of this investigation was the development and publication of a teachers' guide titled A First Look At Distribution. The basic principle followed was that distributive education is a course of study that offers vocational training to provide balanced, comprehensive, instructional programs in all areas of distribution and marketing; to aid in improving techniques of distribution; and to help the student develop and understand the social and economic responsibilities of those engaged in distribution. Such functions as leadership development, channels of distribution, advertising service functions, wholesaling operations; sales supporting operations such as warehousing, financial services and auxiliary services of all kinds, must be included in educational programming if obligations to students of distribution are fulfilled.

The scope and sequence of the course outline was designed to place emphasis on such areas as orientation to the world of work, channels of distribution, recognizing and developing personal characteristics, specific skills for initial business employment, and finally, the background to prepare the individual for actual entry into a distributive occupation. The assumption was made that in order to elect a career objective, a student must know something about the various elements from which the choice will be made. A relationship must be developed that is the product of the individuals personal make-up, combined with what he has learned, resulting in a logical movement toward the vocational objective of that person.

This guide was developed for use in a one-year course of study. Hopefully, it can be used not only in metropolitan

areas but in small schools which cannot offer a total distributive education program, and schools located in areas not served by a merchandising complex capable of providing sufficient work-training stations for a regular "Co-op" program. It was designed to be used as a beginning course at high school, community college, or vocational-technical school levels.

During the 1966-67 school year the guide has been used on a trial basis at selected schools throughout the State. In the summer of 1967, the consultant will be hired again to evaluate the guide after its use, and make whatever changes seem necessary.

Agri-Distribution Feasibility Study

During the summer of 1966, discussions were held with personnel from Big Bend Community College about the future of farming and business in their area. The college is located at Moses Lake in the center of the State, in an expanding agricultural setting. Although acreage and income from agriculture was increasing because of the continued development of the Columbia Basin Irrigation Project, actual farm employment was decreasing due to technological advances. At the same time unmet needs existed for employees in farm-related occupations. Big Bend Community College proposed the establishment of an agri-distribution curriculum if investigation warranted it.

The community college at Moses Lake is ideally suited to carry out such a training function. It is located in the heart of the Columbia Basin farming and processing area, and has on-going agricultural and technical training programs. With this background, the Research Coordinating Unit contracted with the college to carry out a seven months investigation into the possibilities of establishing a two-year technical training program in agri-distribution. The project will not be completed until May 1967, therefore only preliminary findings can be reported here.

Through contact with farm managers, processors, suppliers, and personnel from agencies such as the Bureau of Reclamation, some dramatic changes were brought to light. Through the Columbia Basin Project large-scale irrigation became a reality in 1951, resulting in the Moses Lake area becoming one of the largest food processing centers in the United States. In the next ten to twelve years production in the presently irrigated land will quadruple, and in addition, another million acres will be brought under irrigation, increasing productivity seventeen fold. Need for services to these farms and processing functions will increase in

a like manner.

Preliminary research indicated that educational programs were needed in four areas:

1. to upgrade employees fairly well-trained in agriculture, but needing work in distributive education;

2. to upgrade employees with considerable training in distributive education, but needing development of knowledge and skills of agriculture;

3. to provide training in new and developing techniques in both areas for persons with knowledge and skills in both; and

4. to provide education and training for high school graduates to fit them for management and supervisory positions with agriculturally related business and industry.

The objectives of the study were to determine by survey:

1. the tasks performed by persons at various levels in agri-distribution occupations;

2. the knowledge and competencies necessary and useful in the performance of agri-distribution tasks;

3. the extent of career employment opportunities in agri-distribution occupations; and

4. the extent to which employers in agri-distribution occupations are willing to contribute to training programs.

Interview questions were prepared in two forms; one for employers, and one for employees. The agri-distribution industries were categorized in order to get the widest possible coverage of occupation types.

Results of the project are unknown at this time except as already indicated. However, it is gratifying to report considerable interest in the project by industry in the area, and by educational institutions throughout the region.

Industry-Education Cooperative Training Program

When the Boeing Airplane Company, the State's largest single industry, faced a critical labor shortage, representatives of labor, industry and education joined forces to help find a solution. Skilled employees were desperately needed in the mushrooming aircraft industry. A plan of action was initiated to relieve the situation in February 1966.

An immediate and obvious source of labor was the high school seniors graduating in June. There was some question whether adequate training could be given between March and June, but it was decided to try. Involved in the decision were local school districts, the Boeing Company, the State Office of Public Instruction through the Division of Vocational Education and the Research Coordinating Unit, and the State Employment Security Office.

Cooperating agencies agreed the proposal was a good one because young people would be prepared to enter aviation industry employment with specific job skills, and would provide an excellent screening situation. It would permit the school and employer to evaluate potential employees in their home school environment. It also would provide a student the unique opportunity to try out a specialized skill without committing himself to an employer.

Completing the course were 578 students including 50 girls, in 28 classes at 18 centers, involving 13 school districts. This pilot project was called High School Final Assembly Program. The aim of the program was to train selected volunteer students on a "crash" basis for immediate employment after graduation. Most students added the course to their regular high school program, thus increasing their school day by about two hours.

Before the courses began, instructors selected to teach these courses attended three separate industrial training seminars sponsored by the Boeing Company. Local school districts provided shops, laboratories, classrooms and administration, while the State Office of Public Instruction provided coordination, state support and overall leadership activity. Local schools generally provided the tools needed, and Boeing supplied instructional materials from its own in-service training section as well as some highly specialized tools. Classes were conducted under conditions as near as possible as that to be encountered on the job.

During the closing days of this Research Coordinating Unit project, an evaluation of the pilot program for final assemblymen was begun, which will continue into the new RCU project. The evaluative instrument used was the one developed under another RCU contract, for a follow-up of vocational students. In this way the instrument will be pilot-tested prior to its statewide implementation in the fall of 1967, as well as furnishing data for the High School Final Assembly Program.

The Boeing Company and participating schools were enthusiastic enough about the program to continue it in the fall of 1966 without evaluation. The continuation project, known as the Aircraft Manufacturing Training Program, will train students as final assemblers, mock-up mechanics, junior draftsmen, jig builder mechanics, plastic and plaster pattern makers, and template makers.

Programmed Instruction for Agricultural Education

Development of a programmed instruction curriculum for vocational agriculture was undertaken jointly by the Research and Development Center, Washington State University and the Research Coordinating Unit.

The purposes of the project were:

to develop a supply of up-to-date programmed instructional materials;

to establish channels for the early development and adoption of instructional materials, including programmed instruction and visual transparency masters to be used in logical systems of instruction; and

to demonstrate the feasibility of utilizing programmed instructional units in vocational agriculture.

The resulting 207-page guide entitled Programmed Instruction for Vocational Agriculture Teachers, contains seven programs designed to complement the present vocational agriculture curriculum. In September 1966, the guide was pilot tested in sixteen schools, and the results will be evaluated during the summer of 1967.

Vocational Education Costs Study

A major study undertaken by Research Coordinating Unit personnel was an analysis of costs of vocational education in Washington State. The objective was to determine the cost per contact hour of vocational education in community colleges and vocational-technical institutes, for total programs and for specific courses. The data were desired in order to present factual cost information to State Legislators and other interested persons at a time when the administration of community colleges and vocational education institutes was being separated from the Office of the Superintendent of Public Instruction by an act of the Legislature.

Much of the information was gleaned from community college annual financial reports, school district general fund expenditure reports, and from a variety of vocational reports. Fifteen community colleges and eight vocational-technical institutes were involved in the analysis, the emphasis being entirely at the post secondary level of education. Included were all but one community college and one vocational-technical institute; the latter two were excluded because information available from them was incomplete or unadaptable to the study.

In addition to an analysis of total vocational programs offered, selected courses were investigated for in-depth study. These specific courses were:

Engineering Aides
Office Occupations
Electronic Technicians
Welding
Mid-Management
Licensed Practical Nurses
Key Punch Operators
Auto Mechanics
Data Processing Technicians

A minimum of four institutions was analyzed for each specific course, and when possible, a balance between community colleges and vocational-technical institutes was maintained.

The general observation can be made that costs were greater in community colleges than vocational-technical institutes. The five most expensive programs were in community colleges, whereas the four least expensive were in vocational-technical institutes. Costs per contact hour for total programs in each institution

ranged from $1.96 to $ .57. For specific courses the greatest cost per contact hour was $2.60 (shared by mid-management and key punch operators - both in community colleges), and the least costly was licensed practical nurses at $ .68, in a vocational-technical institute.

There was considerable difference in the volume of vocational programs at any given community college which should be because of the varying sizes of the institutions. However, there was also considerable difference in the percentage of total program devoted to vocational courses from one college to another, in terms of contact hours. The highest percent was 36.29, the lowest 4.21 with the mean equal to 17.45%.

In terms of expenditures the largest vocational program accounted for 35.47% of the total, the smallest 4.79%, and the mean was 16.80%. The relationship of vocational salaries to total salaries followed the same pattern; a high of 34.21%, a low of 5.69%, and the mean was 16.69%.

Although there was considerable difference between community colleges, there was a very close correlation within colleges in terms of time devoted to vocational education and costs of total programs and costs of instructional salaries - the latter item being the single major cost factor.

When considering the total vocational programs offered in all institutions, the cost per student contact hour was $1.2933 in community colleges, and $1.1052 in vocational-technical institutes: a difference of $ .1881 per hour. For selected courses the overall cost per contact hour was $1.3344 for community colleges, and $1.0452 for vocational-technical institutes: a difference of $ .2892 per hour. By chance, the selected courses showed a greater differential than that for total programs. This would indicate that some courses not examined would have less differential than that of the total programs.

The cost per contact hour for all vocational programs in both community colleges and vocational-technical institutes is $1.1619. Selected programs on the same basis show a cost of $1.1642: a difference of $ .0023.

Instructional salaries in the community college vocational program accounted for 52.997% of total vocational expenditures. For selected courses the percentage was 53.025. In vocational-technical institutes, instructional salaries were 43.338% of total program expenditures. For selected courses

the amount was 47.94%. The differences were 9.659% and 5.089% respectively.

The cost per contact hour for vocational-technical school total programs was 85.455% of the per hour cost of community college vocational programs. In terms of selected courses, vocational-technical cost were 78.327% of community college costs per contact hour. Instructional salaries in vocational-technical institutes were 69.886% of community colleges instructional salaries; and for selected courses, the percentage was 70.082.

The eight vocational-technical institutes accounted for 69.861% of all vocational contact hours at 66.452% of the cost of all vocational programs, while fifteen community colleges were responsible for 30.139% of contact hours at 33.548% of the costs. For selected courses vocational-technical institutes accomplished 58.812% of the contact hours at 52.796% of costs. Community colleges accounted for 41.188% of hours at 47.204% of costs.

Manpower Needs in Health Occupations

Early in the history of the Research Coordinating Unit, the director was asked to serve as consultant to a pilot study of manpower problems in medical industries in King County, conducted by the Washington State Employment Security Department and the State Boards for Vocational Education. Planned through inter-agency cooperation as a community service, its purpose was to try out a procedure to analyze occupational shortages and training requirements on a continuing basis for a wide range of occupations and industries.

In the State of Washington, as is true throughout the nation, Health Services is one of the most rapidly expanding and changing industries. It was chosen for this survey because of its high demand for workers and its anticipated expansion in present occupations and into new occupations expected to develop. It also offers potential employment to large numbers of workers with relatively short periods of training, and is therefore, a fruitful source of jobs for young people who have the highest rate of unemployment. The medical field also has severe shortages of manpower supply in some occupations that may become more critical as new facilities are put into operation to serve the growing population. The broadening of various public and private medical insurance programs is expected to increase demand for medical care as more people avail themselves of these services.

Technological advances also contribute to present and anticipated shortages of manpower.

The present study was undertaken for two main purposes:

1. To try out a pilot program of research in the health service field that would identify and describe a range of occupations in relation to their present and future employment needs, and which could be adapted to a variety of other industries in the community.

2. To present significant findings as to the growth potential and employer hiring requirements of certain occupations that would assist and encourage the development of training facilities and programs designed to fit the pattern of local needs.

Analysis of the data indicated King County health care industries employed approximately 19,526 workers in December 1964, according to an estimate based on reports from employers interviewed in this survey. Total employment in the occupations surveyed was estimated at 19,307, to which another 551 new jobs are expected to be added by December 1965 because of expansion to existing plant facilities or services. Within five years, the total of new jobs is estimated at 2876. The anticipated net increase, then, is 3% for 1965 and 14% by 1970. However, the number of workers hired to fill vacancies created by turnover is expected to reach 3016 within one year and 13,331 within the next five years.

Net employment forecasts derived from this survey were conservative estimates, because they exclude replacement figures and because they represent projections from only those institutions then in operation. Medical care facilities being constructed or planned for were not included in the survey.

By 1970 the highest number of additional jobs will occur in hospitals. Next highest is convalescent centers and rest homes. But convalescent centers and rest homes have the greatest net growth forecast (33%), more than twice that of hospitals.

Twenty-six of the 327 occupations identified in the survey show current vacancies or an anticipated net increase of twenty or more jobs within the next five years. In these twenty-six "demand" occupations it is expected that employment will increase more than the industry as a whole (20% by 1970) and that they will account for 80% of the new jobs available within the next five years.

Almost half of these new jobs will occur in the nursing field.

The next highest growth rate is found in clerical occupations and in institutional housekeeping such as ward maids and porters, which have an expected increase of approximately 17%. Food Service Occupations such as cooks, cook helpers, trayline and cafeteria workers, waitresses, and dishwashers, will increase about 14%.

During the time of the survey, 376 job vacancies were recorded by interviewers - positions for which employers were actively recruiting new workers. Ninety percent of these job openings were in the twenty-six demand occupations. The highest number of current job opportunities were for dental hygienists - a total of 140 positions; only 20 were for full-time employment, however. Nursing and other patient care occupations showed the highest number of full-time vacancies, with a total of 109 available positions.

The occupation of orderly is the fastest growing of all in the medical field and has the lowest training output. According to employers, the present employment figure will almost double by 1970 and will account for 280 new jobs and for 439 replacements. Most of the demand for orderlies is expected to be in convalescent centers and rest homes.

The supply of dental technicians, bookkeepers and dental assistants is considered adequate to meet the demand.

Of the twenty-six demand occupations, nine were selected as warranting further investigation involving more definite and descriptive information-gathering.

This survey does not reflect the impact of medicare, which undoubtedly would affect projections.

The Research Coordinating Unit, in addition to offering consultant services, was responsible for the publication of the 110-page report which materialized from the study and had wide distribution throughout the State.

Consultant Services

The RCU participated in several additional projects, offering consultant and liaison services, but not funds. The Director of the Unit participated in the formation of the Research and Development Center at Washington State University. RCU

personnel helped prepare the proposal for the Washington State University project, and was involved in activities of that organization occasionally since its formation.

Close contact was maintained with Seattle Public School personnel in connection with a special vocational education project at the secondary level. In this, the Rainier Beach Project, certain innovative procedures were used to meld vocational and traditional curricula. The Research Coordinating Unit will assist in the evaluation of the project at its termination next year.

The University of Washington School of Business has been funded to complete a project in Distributive Education, and a Research Coordinating Unit representative has attended meetings to be of service as a consultant. Generally, the study is concerned with determining the optimum level at which to teach various DE units; and what basic elements should be included from the standpoint of business.

From time to time the RCU was approached for assistance in funding projects which were not acceptable, generally because they represented duplication of existing efforts. On other occasions different sources were found for funding when the circumstances warranted it. Some proposals were rejected because they did not reflect a research orientation. Still others did not develop because of a lack of interest from those who initiated the proposal.

Dissemination

Only in the latter days of the project was an attempt at dissemination made. Unscheduled progress reports were made to other Research Coordinating Units and an information bulletin was prepared for Vocational Education Department directors and supervisors. Oral reports of RCU activities were given at various state and national meetings.

Over the months a considerable volume of materials accumulated in the RCU files. Without adequate personnel it was not possible to maintain any system of filing. However, with the hiring of a full-time coordinator and secretary, cataloguing the material became one of the challenges to the Unit, and some degree of order had appeared out of chaos by the end of the project.

DISCUSSION

The Research Coordinating Unit came closest to attaining its goals or objectives in the area of contract research. Although some of these projects were superior to others, all contributed to some degree toward better meeting the vocational needs of youth. Through these projects vocational educators should be helped in determining how best to prepare students to enter the world of work and become useful citizens.

Probably the most useful evaluation would be concerned with areas that need change or initiation in the operation of the RCU. Obvious is the need for more complete dissemination of vocational research information. Lack of personnel was the original problem, and a limited staff covering too broad an area was a continuing problem. As a back log of work was diminished, greater effort was directed toward dissemination; and near the end of the contract period, this responsibility was being met with a greater degree of success.

Assuming that most vocational education is at the secondary and community college levels, the RCU put most of its efforts here. In contrast to many Units, limited contact was maintained with four-year institutions. A future development should be closer liaison with the reseach departments of these institutions, with an attempt made to involve graduate students as research interns with the RCU.

Closer working relationships should be developed with the Research and Development Center at Washington State University. Perhaps one problem has been the geographic separation that exists between the Center and the RCU - some 350 miles. The Center has actually had more contact with the Idaho RCU, which is located only eight miles away. This relationship is of value in that it circumvents the artificiality of state boundaries in favor of common interests and problems.

There should have been better communication between the RCU and the Vocational Education Department. To some degree this situation undoubtedly reflects a universal problem, compounded by the unique administrative position of the RCU. The Washington State Office of the Superintendent of Public Instruction has a research division and the Unit is a part of it, rather then being administered and housed with the Division

of Vocational Education. Now, by an act of the State Legislature, vocational education has been separated completely from the Office of the Superintendent of Public Instruction, but the Research Coordinating Unit remains. Consensus indicates that the Unit should become administratively and physically a part of vocational education in a new organizational pattern.

CONCLUSIONS

In spite of initial staffing problems, the RCU made a positive contribution to education in meeting the vocational needs of youth in Washington State. The Unit was most successful in completing projects conducted under contract with school districts and individuals. Least success in achieving goals was in the area of dissimination. Difficulty in obtaining staff was primarily responsible for this situation, which was remedied to some degree by the completion date of the project.

Activities of the RCU will always be limited by the small staff and attempts should be made to make use of graduate students and consultants in order to broaden the scope of RCU involvement.

A closer administrative relationship with vocational education would improve communication with that department, which has recently been separated from the Office of the Superintendent of Public Instruction by legislation.

Coordination of vocational research can only be fragmentary because communication between individuals and agencies involved is incomplete and voluntary. Distinction between coordination and supervision is frequently not clear, which might tend to make a request for information suspect as a desire for control.

The image of the Research Coordinating Unit is still in a formative stage. Probably a great deal more involvement must take place before the true posture of the Unit can be determined. However, there should be no question of the worth and need for continuation of this effort as an adjunct to vocational education.

SUMMARY

The Research Coordinating Unit for Vocational Education in the Washington State Office of Public Instruction, was approved to begin operation June 1, 1965, and continued through one

extension, to February 28, 1967.

The general objective of the Unit was to initiate, coordinate, and relate various vocational research projects, activities and information already existing and planned, to meet the special vocational needs of youth in Washington State. This objective was to be achieved by coordinating various vocational research activities, designing and conducting research projects, serving as a clearinghouse and dissemination source of vocational research information and providing skilled research consultant services to vocational educators in the State. All these were carried out with varying degrees of intensity.

The RCU was located in the Office of the Superintendent of Public Instruction, Olympia, Washington, as a part of the general Research Office. Staff members included a Director and an Information Specialist at one-fourth time each, a consultant at one-half time, and a full-time Coordinator and Secretary. For the greater portion of the twenty-one months the RCU was funded, it was inadequately staffed, having no full-time personnel. This factor caused the Unit's productivity to be somewhat less than was hoped for initially.

Major projects carried out by contract between the RCU and certain educational agencies and individuals were:

a follow-up system using data processing techniques;

a needs survey for Oceanography technicians;

development of an innovative, introductory program for Distributive Education;

an Agri-Distribution feasibility study;

a cooperative training program involving the airplane industry; and

development of a programmed instruction innovation in agricultural education.

The Research Coordinating Unit staff conducted a vocational education costs study for use by the Vocational Education Department in connection with that Department's separation from the Office of the Superintendent of Public Instruction. This placesthe RCU in a different department of

State Government than the Division of Vocational Education; creating a less than desirable situation.

RCU personnel attended a number of state and national conferences and seminars and were called upon frequently to act as consultants to research projects conducted by other educational agencies in the State.

Information about completed projects was distributed widely, but no scheduled bulletin was published. An information sheet was made available to State Office staff members, with future plans for extension of dissemination to all vocational education personnel in the State. Dissemination is an area that needs to be expanded in the future.

The limited budget and staff of the Research Coordinating Unit would indicate a need to exploit other personnel sources such as graduate students of four-year institutions. Involvement was predominantly at the secondary community college level during the course of the project, and more dialogue with four-year institutions would probably be desirable. Administrative changes in the operation of the RCU seem necessary, due to recent enactments of the State Legislature. Simplification of lines of communication are called for to increase productivity and efficiency.

The Research Coordinating Unit is still in a formative stage, but there should be no question as to the desirability of its continuation as an adjunct to vocational education in Washington State.